US005931425A

United States Patent [19]

Oliva

[11] **Patent Number: 5,931,425**

[45] **Date of Patent: Aug. 3, 1999**

[54] **APPARATUS AND METHOD FOR MOUNTING AND STABILIZING ELECTRICAL JUNCTION BOXES BETWEEN WALL STUDS**

[76] Inventor: **John H. Oliva**, 875 New Bedford Pl., Fairfield, Calif. 94533

[21] Appl. No.: **08/886,202**

[22] Filed: **Jul. 1, 1997**

[51] **Int. Cl.**[6] **F04G 25/00**

[52] **U.S. Cl.** **248/200.1**; 248/906; 174/58

[58] **Field of Search** 174/53, 54, 58, 174/63, 50; 248/200.1, 205.1, 909, 906, 546, 343, 27.1, 57; 220/3.9, 3.5

[56] **References Cited**

U.S. PATENT DOCUMENTS

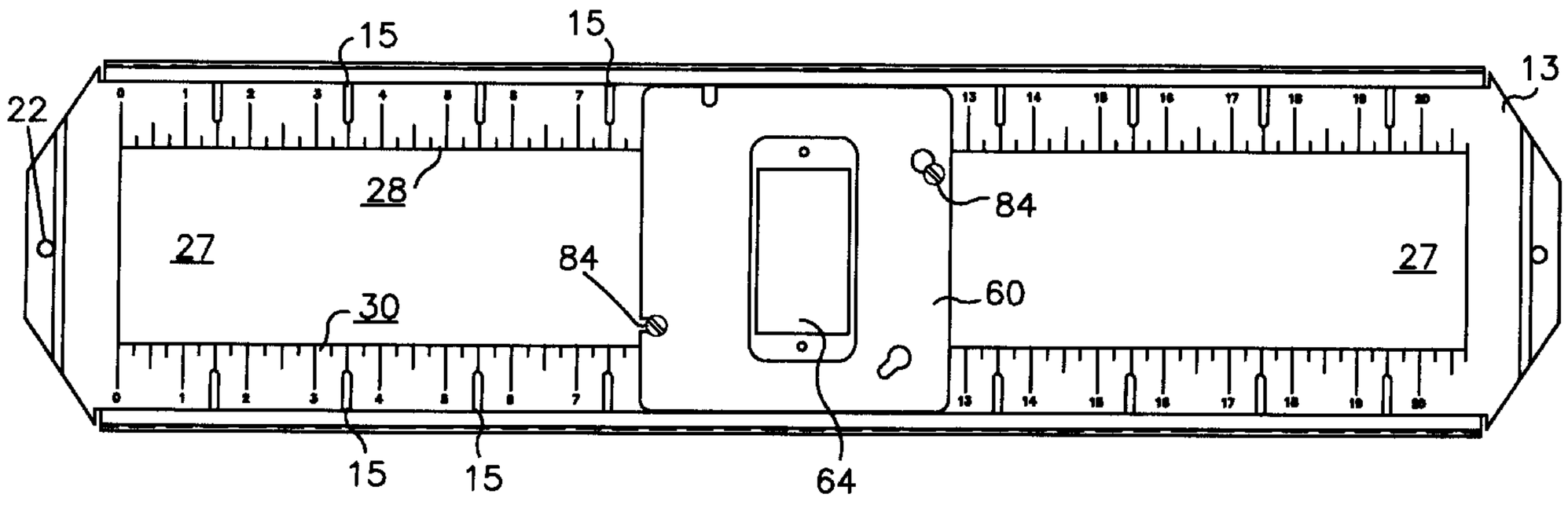
1,211,182	1/1917	Kruse	248/218.4
1,288,024	12/1918	Kendig	220/3.9
1,814,449	7/1931	Morgenstern	220/3.9
1,850,616	3/1932	Barnett	220/3.9
3,039,729	6/1962	Nagle	248/343
3,917,899	11/1975	Oliver	174/57
4,757,967	7/1988	Delmore et al.	248/218.4
4,964,525	10/1990	Coffey et al.	220/3.9
4,967,990	11/1990	Rinderer	248/205.1
5,114,105	5/1992	Young	248/27.1
5,330,137	7/1994	Oliva	248/27.1

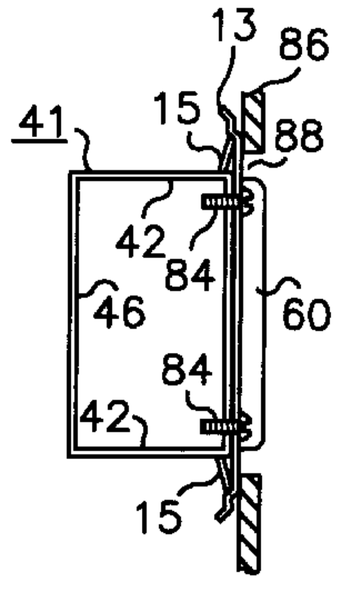
Primary Examiner—Ramon O. Ramirez
Assistant Examiner—Gwendolyn Baxter
Attorney, Agent, or Firm—Michael L. Louie; Beyer & Weaver, LLP

[57] **ABSTRACT**

A mounting bracket including a flat elongated frame having front and rear faces and opposing ends for attaching to adjacent wall studs. The bracket has a central cut-out portion which defines top and bottom members. The open front end of an electrical box is placed flush against the rear face of the bracket and contacts the top and bottom members of the bracket. The front face of the box is substantially flush with the plane formed by the wall studs regardless of the depth of the box. Boxes are stabilized against disorientation relative to the cut-out portion by upper and lower spaced-apart tabs that protrude from the rear face at a selected angle to engage the upper and lower surfaces of the box. An accompanying faceplate is placed on the front face of the bracket opposite and aligned with the box and in contact with the top and bottom members. The faceplate is fastened to the box with the bracket disposed between box and faceplate, and with upper and lower forward edges of the box in contact with the protruding tabs on the rear face of the bracket. Measurement rules may be marked on the front faces of the upper and lower members to facilitate convenient location of one or more electrical boxes within the cut-out portion of the bracket.

12 Claims, 3 Drawing Sheets





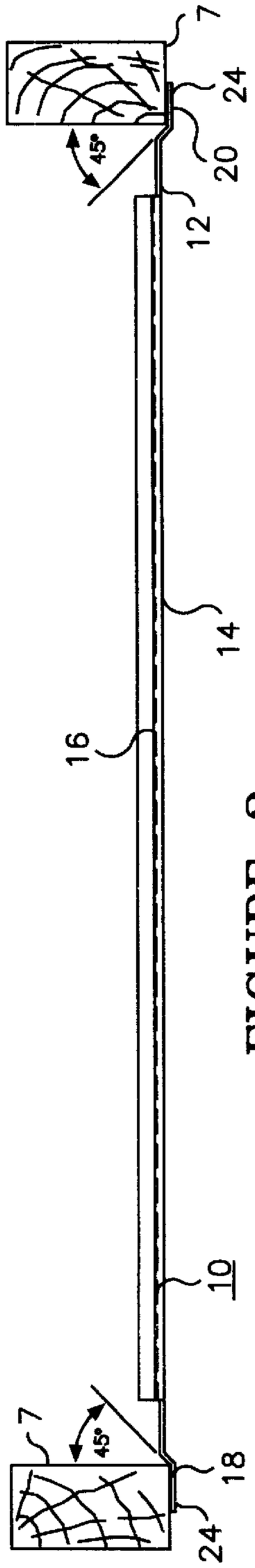


FIGURE 2

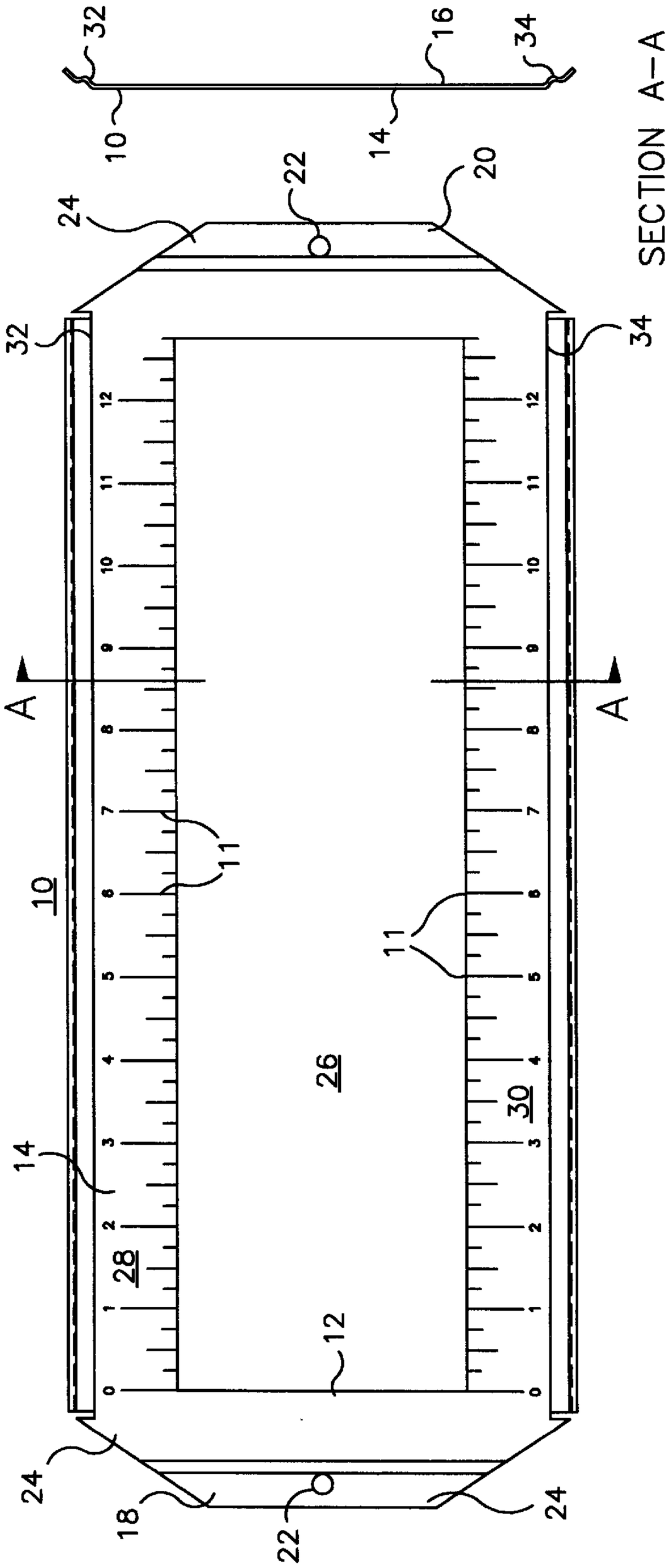


FIGURE 3

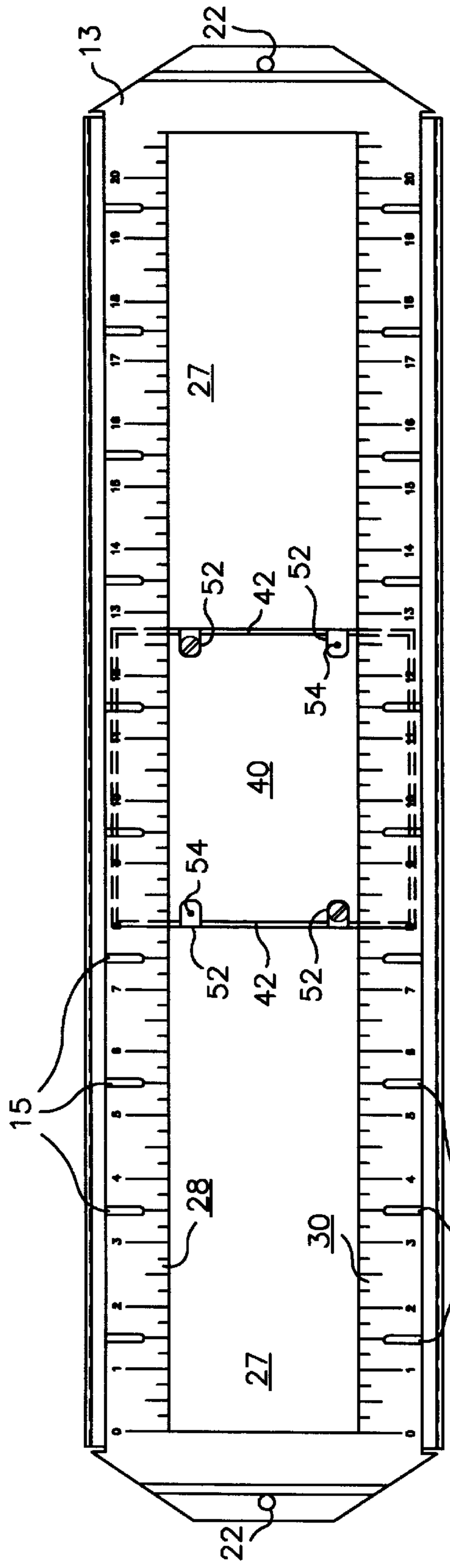


FIGURE 4

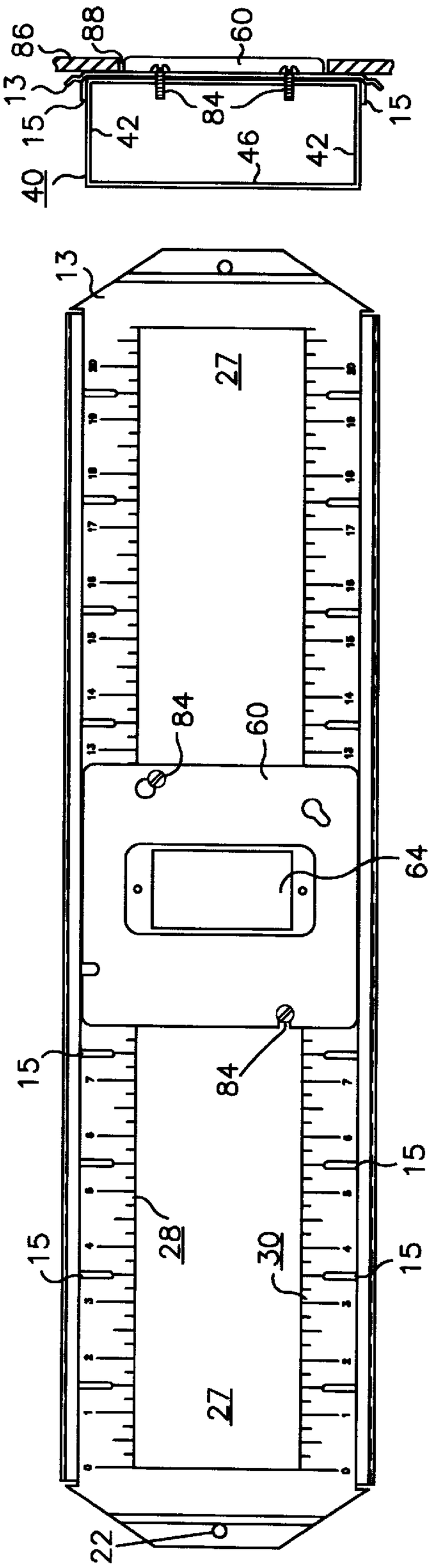


FIGURE 5

FIGURE 6

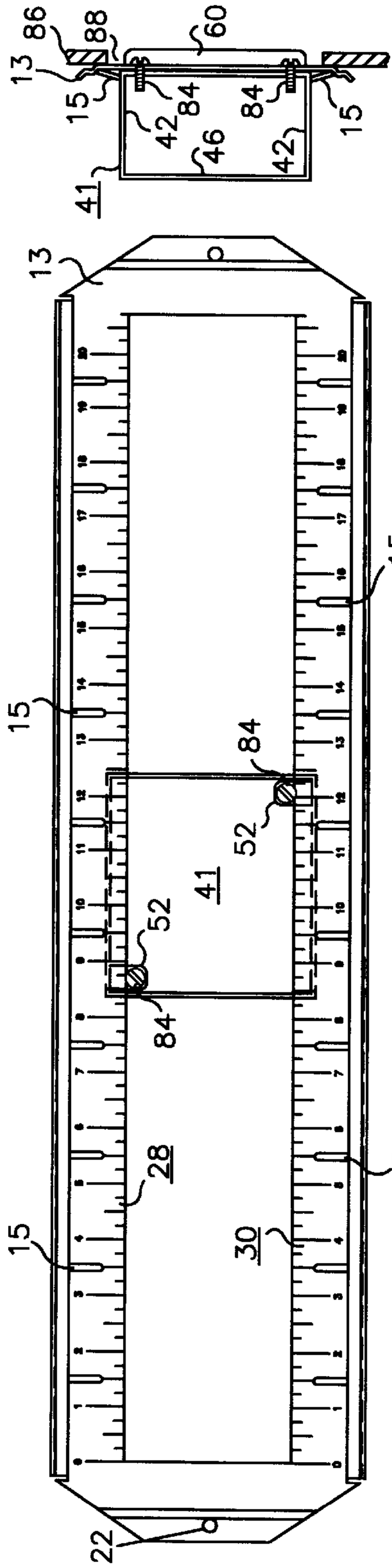


FIGURE 8

FIGURE 7

APPARATUS AND METHOD FOR MOUNTING AND STABILIZING ELECTRICAL JUNCTION BOXES BETWEEN WALL STUDS

RELATED CASE

The subject matter of this application is related to the subject matter of U.S. Pat. No. 5,330,137 which is incorporated herein by this reference.

FIELD OF THE INVENTION

This invention relates to mechanical brackets for mounting electrical boxes between studs in a wall and more specifically to a mounting bracket which allows electrical junction boxes having different depths to be mounted on the same bracket, and which stabilizes boxes so mounted from positional disorientation within the bracket.

BACKGROUND OF THE INVENTION

Brackets for mounting electrical boxes between wall studs are commonly used to conveniently traverse the space between the studs and mount an electrical box at any location in the space between adjacent studs. (See, for example, U.S. Pat. No. 4,967,990).

In mounting bracket applications, it is desirable for the front of the electrical box, after mounting, to be substantially flush with the front portions of the two studs. This is because wall board is commonly set against the front of the two studs, and it is desirable for the front of the electrical box to be substantially flush with that section of wall. Conventional mounting brackets fulfills this requirement adequately when all of the boxes have the same depth. However, when boxes of differing depths are to be mounted, conventional brackets fail to provide satisfactory results. Because boxes of various depths are used regularly in the construction industry, it is important for a mounting bracket to be capable of accommodating boxes having different depths. Also, it is desirable to accommodate junction boxes of different widths and mounting schemes in such versatile manner that the box remains firmly positioned without dislocations or skew offsets as the wall is being completed.

SUMMARY OF THE INVENTION

In accordance with the present invention, an improved mounting bracket includes a flat, elongated frame having a front face, a rear face, first and second opposing ends attachable to wall studs, and a central cut-out portion defining a top member and a bottom member of the bracket. The top and bottom members of the bracket above and below the cut-out are preferably bent or otherwise formed as a rearward recess with a lineal shoulder along the rear top and bottom edges of the bracket to provide a 'referencing' edge or shoulder for wide junction boxes to inhibit angular skewing or positional dislocation when installed adjacent the cut out portion of the bracket. Each of the opposing ends of the frame preferably includes a surface which is elevated above and substantially parallel to the front face of the frame. In another embodiment, tabs are provided along top and bottom edges of the frame for selective bending into registration with the overall height of junction boxes of different dimensions.

In use, the bracket of the present invention preferably is attached between two wall studs with the front face of the frame substantially flush with the plane formed by the two studs. Once attached to the studs, the bracket may be used

to mount one or more electrical junction boxes. Each electrical box is preferably of conventional construction comprising a plurality of sides, a back end and an open front face. To mount the electrical box to the frame, the open front face of the box is placed flush against the rear face of the frame and positioned with a top front edge of the box in contact with the lineal shoulder along the rear, top edge of the bracket, and with the bottom front edge of the box in contact with the lineal shoulder along the rear bottom edge of the bracket. Alternatively, a selection of tabs formed along the top and bottom edges of the bracket may be bent rearwardly to provide referencing shoulders for the size of junction box being mounted. A faceplate associated with the box is placed against the front face of the frame opposite and in alignment with the electrical box and positioned with a top portion of the faceplate in contact with the top member of the frame, and with a bottom portion in contact with the bottom member of the frame. To complete the mounting, the electrical box is fastened to the faceplate, preferably by means of screws or bolts. Because the electrical box and the faceplate sandwich the frame, fastening the electrical box to the faceplate secures the box to the faceplate and also secures the box and the faceplate to the frame. In addition, the recessed edges, or selection of bent tabs, along substantially the entire top and bottom edges of the frame serve to stabilize large electrical boxes at any position along the frame against disorientation relative to the bracket, and such recess edges or shoulders additionally serve as stiffeners over a substantial portion of the entire length of the bracket between studs.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front view of one embodiment of the mounting bracket of the present invention.

FIG. **2** is a side view of the mounting bracket shown in FIG. **1**.

FIG. **3** is a sectional view of the mounting bracket of the present invention.

FIG. **4** is a front view of another embodiment of the present invention including a plurality of tabs for selective placement against top and bottom surfaces of a junction box.

FIG. **5** is a side cross-sectional view of the bracket of FIG. **4** with an electrical box mounted on the bracket.

FIG. **6** is a front view of the embodiment of the bracket illustrated in FIG. **4** showing an installed face plate.

FIG. **7** is a front view of the embodiment of FIG. **4** illustrating an attached junction box of different configuration.

FIG. **8** is a side sectional view of the embodiment of FIG. **7** illustrating different tab placement relative to the size of the junction box.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. **1** and **2**, there are shown frontal and side views, respectively, of one embodiment of the mounting bracket of the present invention. The bracket **10** is a substantially flat and elongated frame **12** that is preferably constructed of a relatively rigid material. The rigidity of the material provides the frame **12** with the necessary structural strength. For brackets formed of metal, electrical conductivity enables the frame **12** to function as an electrical ground. As an example, frame **12** may be constructed of **20** gauge galvanized sheet metal, and may include rule markings **11** stamped or printed or otherwise formed on the front

surface of the bracket **10** for convenient placement of electrical boxes thereon. Alternatively, the frame may be extruded of plastic or aluminum for subsequent bending and punching out of the central cut-out region **26** and mounting holes **22**.

Frame **12** comprises a front face **14**, a rear face **16**, and first **18** and second **20** opposing ends, each end preferably having a hole **22** therein for receiving a nail or other fastener therethrough for attaching the frame **12** to a corresponding wall stud **7**. Each of the ends **18**, **20** preferably has a flat surface **24** which is bent forward from the body of the frame **12**. The surface **24** is elevated above the front face **14** of the frame **12** and is substantially parallel thereto, as shown in FIG. **2**, wherein the surface **24** is shown elevated above the front face **14** of the frame **12**. The distance by which the surface **24** is raised above the front face **14** is determined by the thickness of the faceplate which is attached to the frame and the size of the head of the screw which is used to attach the faceplate to the frame. Although this distance may vary depending upon the faceplate and the screw used, it is preferably about 0.5 centimeters. The rearward side of surface **24** at each end of the frame **12** contacts a corresponding wall stud. Because wall studs are typically separated by center-to-center distances of either sixteen or twenty-four inches, the two elevated surfaces **24** are also preferably separated appropriately at the ends of correspondingly shorter or longer frames **12** for mounting on adjacent studs **7** spaced on either sixteen or twenty-four inch centers.

In the central part of the frame **12**, the substantial cut-out portion **26** defines a top member **28** and a bottom member **30** of the frame. The cut-out portion **26** preferably has a height of between three inches and three and one half inches to correspond with the height of the open front face of a typical electrical box.

Stabilizing or referencing lineal shoulder **32**, **34** at the top and bottom edges of the frame enhance the structural rigidity of the frame **12** and provide reference edges for engaging corresponding top and bottom forward edges of an electrical box. The entire top edge of top member **28** is preferably bent backward at substantially a right angle with respect to the front face **14** of the frame **12**, and is then bent outward at substantially right angle (or plane parallel to the front face) in order to form a recess in the front face and the lineal shoulder **32** in the rear face of the frame **12**, as shown in FIG. **3**. Similarly, the entire bottom edge of the bottom member **30** is also preferably bent backward at substantially a right angle with respect to the front face **14** of the frame **12**, and is then bent outward at substantially right angle (or plane parallel to the front face) in order to form a recess in the front face and the lineal shoulder **34** in the rear face of the frame, as shown in FIG. **3**. These recesses along substantially the entire lengths of the upper and lower edges of the frame impart to the frame an enhanced structural rigidity to resist both torsional forces and bending forces. Of course, such lineal shoulders **32**, **34** on the rear face may be formed, for example, by extruding a length of material with the shoulders **32**, **34** integrally formed thereon near the upper and lower rear edges, for final fabrication by forming the ends **18**, **20**, and punching the holes **22** and the cut-out **26**.

The corners of the mounting surfaces are beveled to allow nails to be driven into supporting studs **7** at locations where the corners would otherwise be present. Since a large number of structures are commonly nailed or otherwise attached to the studs, the beveled corners expose as much of the supporting studs as possible to accommodate the nailing of other structures.

Referring now to the front view of FIG. **4**, there is shown another embodiment of a bracket **13** of similar configuration to the bracket **10** of FIGS. **1**, **2**, and **3**, additionally with a plurality of tabs **15** pre-punched along the upper and lower edges of the bracket. Each such tab remains attached to the frame via an in-tact base, as shown in FIG. **5**, that permits convenient bending of selected ones of the tabs **15** substantially at right angles to the face of the bracket, or at lesser angles as later described herein.

The mounting brackets **10**, **13** of the present invention thus far described may be used to conveniently mount one or more electrical boxes between two adjacent wall studs **7**. A typical electrical box **40** and an accompanying faceplate **60** may be mounted to bracket **10**, **13**, as shown in FIGS. **5** and **6**. The electrical box **40** is preferably of standard construction comprising a plurality of sides **42** having a selected depth, a back end **46**, and an open front face. The back end **46** and one or more sides typically include a plurality of pop-out sections which may be removed to provide access into the interior of the box through such pop-outs. Selected ones of the tabs **15** of bracket **13** near where a junction box is to be mounted may be conveniently bent rearwardly above and below the top and bottom forward edges of the junction box **40** to about a right angle, as shown in FIG. **5**, in order to stabilize the junction box **40** against disorientation relative to the cut out **27** and bracket **13**.

Alternatively, as shown in FIG. **7**, for a smaller junction box **41** of lesser height than the junction box **40** illustrated in FIG. **6**, selected ones of the tabs **15** near where the junction box **41** is to be mounted may only be bent rearwardly by a slight angle in order to position tips of the tabs **15** against the upper and lower surfaces of the box, as shown in FIG. **8**. Optionally, the tabs **15** may be spaced along the length of the cut out portion **27** at approximately 1-inch to 2-inch intervals to assure that a plurality of such tabs **15** can be selectively bent to engage upper and lower surfaces of a box **40**, **41** located anywhere along the cutout portion **27**.

The accompanying faceplate **60**, or 'mud' ring, is preferably of standard construction having a central cut-out portion **64** and at least two holes aligned with the threaded holes **54** in extensions **52** of the junction box **40**, **41**. Thus, screws may be inserted through holes in the faceplate **60** and driven through the cut-out portion **26**, **27** of the bracket **10**, **13** into the threaded holes **54** of the box **40**, **41** to fasten the faceplate **60** to the electrical box **40**, **41** with the bracket **10**, **13** 'sandwiched' or compressed between the box **40**, **41** and faceplate **60**, as illustrated in FIGS. **5** and **8**. The cut-out portion **64** in the faceplate **60** allows access to the interior of the box **40**, **41** after the faceplate **60** is attached to the box **40**, **41**, and also facilitates surface mounting of switches, receptacles, and the like, against a finished wall of sheet rock **86**.

Referring now to the side cross-sectional views of FIGS. **5** and **8**, there are illustrated the brackets **10**, **13** of the present invention mounting electrical boxes **40**, **41** with corresponding faceplates **60**. The bracket **10**, **13** is first attached to the studs **7** by placing each of the elevated surfaces **24** against the front face of a corresponding wall stud, and inserting a screw or nail or other fastener through the hole **22** in each surface **24** and driving the fastener into each of the studs **7** to secure the bracket **10**, **13** to the two studs. As attached, the front face of the bracket **10**, **13** is substantially flush with a plane formed by the front faces of two adjacent studs. After the bracket **10**, **13** is thus secured, an electrical box **40**, **41** is placed against the rear of the bracket **10**, **13** with the open front end of the box **40**, **41** placed flush against the rear face of the bracket **10**, **13**. The upper and lower forward edges of the electrical box engage

the upper and lower lineal shoulders **32, 34** at the rear face (formed by the upper and lower recesses, respectively, in the front face) or, alternatively, engage tabs **15** bent at right angle (or lesser angle) relative to the rear face of the bracket **10, 13**. The faceplate **60** accompanying the box **40, 41** is placed against the front face of the bracket **10, 13** opposite the electrical box **40, 41**. The faceplate **60** is aligned with the electric box **40, 41** with holes in the faceplate **60** aligned with the threaded holes **54** in the extensions **52** on the box **40, 41**.

As shown in FIGS. **3** and **5**, when the front or forward edges of a tall junction box **40** are placed against the rear face of the bracket **10, 13**, a top forward edge of the box **40** contacts the top lineal shoulder **32** of the bracket **10, 13** and a bottom forward edge of the box **40** contacts the bottom lineal shoulder **34** of the bracket **10, 13**. Alternatively, a shorter junction box **41**, as shown in FIGS. **7** and **8**, may contact selected tabs **15** bent suitably, as described above, to engage upper and lower surfaces of the box of smaller height dimensions.

The faceplate **60** is placed against the front face of the bracket with a top portion of the faceplate **60** in contact with the top member **28** of the bracket, and with a bottom portion of the faceplate **60** in contact with the bottom member **30** of the bracket **10, 13** with the bracket **10, 13** effectively sandwiched between the box **40, 41** and the faceplate **60** when in proper mounting position. To complete the mounting, bolts or screws **84** are inserted through the holes in the faceplate **60** and into the threaded holes **54** in the extensions **52** from the electrical box **40, 41** to fasten the box to the faceplate **60**. Because the box **40, 41** and faceplate **60** sandwich the bracket **10, 13**, fastening the box **40, 41** to the faceplate **60** also fastens the box **40, 41** and faceplate **60** to the bracket **10, 13**. The electrical box is thus mounted onto the bracket **10, 13** and is restrained from rotating or otherwise disorienting the open front face of the box relative to the cut out portion **26, 27** of the bracket **10, 13** by the lineal shoulders **32, 34** and/or by the tabs **15** along the upper and lower edges of the bracket **10, 13**.

Preferably, the screws **84** do not go through either the top member **28** or the bottom member **30** of the bracket **10, 13** but instead pass through the central cut-out portion **26, 27** of the bracket **10, 13**. This obviates any need to drill holes into the bracket **10, 13**. Because the screws **84** pass through the central cut-out portion **26, 27** and thus are not constrained by holes in the upper or lower members **28, 30**, it is possible to slide the box **40, 41** and faceplate **60** along the length of the bracket **10, 13** to place the box **40, 41** and faceplate **60** at any desired position along the bracket **10, 13**. In the embodiment of FIGS. **4, 5, 6**, selected ones of the tabs **15** may be suitably bent rearwardly to engage the junction box **40, 41** wherever located along the length of the cut-out portion **26, 27** in order to stabilize the junction box **40, 41** against disorientation relative to the cut out portion **26, 27**.

By repeating the mounting steps described above, a plurality of electrical boxes may be mounted onto a single bracket **10, 13**. A bracket **10, 13** of the present invention may mount one or more electrical boxes in the manner described above, where each box may be of different width and different depth, and different height for common planar reference of the forward open face of each box at the planar orientation of the back face of the bracket **10, 13**. Wallboard, or sheet rock, **86** is then attached to supporting studs with cut outs **88** suitably positioned therein to receive the faceplate, or 'mud' ring **60** in flush orientation of outer faces and edges, ready for application of conventional wallboard texturing compound, or 'mud', to fill cracks and seams.

What is claimed is:

1. A mounting assembly for attachment between two wall studs comprising:

an elongated frame having a front face, a rear face, first and second opposing ends attachable to said wall studs, and a central cut-out portion defining a top portion, a bottom portion and side portions thereof;

a plurality of upper tabs spaced-apart in the frame top portion and a plurality of lower tabs spaced-apart in the frame bottom portion for selectively protruding from a rear face at selected spaced-apart locations substantially along the length of the top and bottom portions between the side portions of the cut-out portion;

an electrical box having an upper surface and a lower surface terminating at respective upper and lower forward edges to define an open front end thereof, the front end of said box is further configured to be placed flush with the rear face of said frame with a portion of said box contacting the frame top portion and another portion of said box contacting the frame bottom portion, the upper tabs of said frame being oriented and of sufficient length to protrude from the rear face of the frame top portion to supportively engage the upper surface of the electric box, and the lower tabs of the frame being oriented and of sufficient length to protrude from the rear face of the frame bottom portion to supportively engage the lower surface of the electric box;

a faceplate positioned on the front face of said frame opposite and in alignment with said electrical box, with a portion of said faceplate contacting said top portion and another portion contacting said bottom surface of said frame; and

a fastener inserted through said faceplate and cut-out portion for fastening said faceplate to said electrical box with the top portion and the bottom portion of the frame disposed between the forward edges of said box and said face plate.

2. The assembly of claim **1**, wherein an upper region of said frame top portion is folded at a selected angle with respect to said rear face to form an upper shoulder protruding therefrom to provide enhanced structural rigidity.

3. The assembly of claim **2**, wherein a bottom region of said frame bottom portion is folded at a selected angle with respect to said rear face to form a lower shoulder protruding therefrom to provide enhanced structural rigidity.

4. The assembly of claim **3**, wherein the upper tabs extend downwardly from the upper shoulder of the top portion, the lower tabs extend downwardly from the lower shoulder of the bottom portion.

5. The assembly of claim **3**, wherein the front face includes measurement marks along at least one of the top portion and bottom portion over substantially the length of the central cut-out portion.

6. The assembly of claim **1**, wherein a plurality of selected tabs of the plurality of upper and lower tabs protrude from the rear face substantially perpendicular thereto to engage upper and lower surfaces of the electrical box.

7. The assembly of claim **1**, wherein a plurality of selected tabs of the plurality of upper and lower tabs protrude from the rear face at an acute angle relative thereto to engage upper and lower surfaces of the electrical box.

8. A method for mounting between two wall studs an electrical box an upper surface and a lower surface terminating at respective upper and lower forward edges about an open face, the method comprising the steps of:

attaching to the wall studs an elongated frame having a front face, a rear face and a central cut-out portion defining a top portion and a bottom portion, each portion having a plurality of spaced-apart tabs protruding from the rear face along a portion of the length thereof near an upper edge of the top portion and near a lower edge of the bottom portion;

orienting a plurality of selected tabs of the plurality of spaced-apart tabs into supportive engagement with the respective upper and lower surfaces for aligning an open front of the electrical box with the central cut-out portion of the elongated frame;

placing a faceplate against the front face in engagement with the top and bottom portions opposite and in alignment with the electrical box; and

positioning a fastener through the central cut-out portion between faceplate and electrical box for fastening the faceplate and electrical box together with the frame disposed therebetween for stabilizing the electrical box between the selected protruding tabs at a selected location along the lengths thereof and against disorientation of the open face of the electrical box relative to the central cut-out portion.

9. The method according to claim **8**, wherein,

said orienting step includes the step of bending the plurality of selected tabs to protrude from the rear face substantially perpendicular thereto to engage the respective upper and lower surfaces of the electrical box.

10. The method according to claim **8**, wherein,

said orienting step includes the step of bending the a plurality of selected tabs to protrude from the rear face at an acute angle relative thereto to engage the respective upper and lower surfaces of the electrical box.

11. The method according to claim **8** further including the step of folding an upper region of the frame top portion at a first selected angle with respect to said rear face to form an upper shoulder protruding therefrom to provide enhanced structural rigidity, and folding a bottom region of the frame bottom portion at a second selected angle with respect to said rear face to form a lower shoulder protruding therefrom to provide enhanced structural rigidity.

12. The assembly of claim **11**, wherein the upper tabs extend downwardly from the upper shoulder of the top portion, the lower tabs extend downwardly from the lower shoulder of the bottom portion.

* * * * *